

03/16/05

AF# 12W

Docket No. 3229-4003

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Serial No. : 09/581,885
Appellant : Jukka JÄKÄRÄ et al.
Filing Date : September 14, 2000
For : BLEACHING OF CHEMICAL PULP WITH PERACID

Confirmation No. 7120

Art Unit : 1731
Examiner : Marc S. Alvo
Docket No. : 3229-4003
Customer No. : 27123

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APPEAL BRIEF/REPLY BRIEF/SUPPLEMENTAL BRIEF TRANSMITTAL

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P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

- ☒ Transmitted herewith is the Appeal Brief for Appellant(s) which is due on March 15, 2005. The Notice of Appeal was filed on December 15, 2004.
- ☐ Transmitted herewith in triplicate is the Reply Brief for Appellant(s) which is due on _____. The Examiner's Answer was mailed on _____.
- ☐ Transmitted herewith in triplicate is a Supplemental Brief for Appellant(s) which is due on _____ in response to the Office Action reopening prosecution on _____. Appellant(s) hereby request that the appeal of the above-identified application be reinstated.
- ☒ A Petition and Fee for Extension of Time was filed with an Amendment Under 37 C.F.R. §41.33 on March 11, 2005 to extend the term for filing the enclosed Appeal Brief. Accordingly, Applicants believe no additional extensions of time are necessary. However, if the Commissioner determines additional extensions are necessary, Applicants hereby petition for the additional extensions.

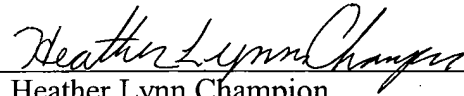
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Respectfully submitted,

Dated: March 15, 2005



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PATENT



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**APPELLANT'S APPEAL BRIEF
PURSUANT TO 37 C.F.R. § 41.31(a)**

MAIL STOP: Appeal Brief

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Pursuant to the provisions of 37 C.F.R. § 41.31(a), Appellants hereby appeal the pending rejection of claims 1, 2, 4-7 and 9-19, which have been twice rejected, first in the March 19, 2003 Office Action, and again in the September 17, 2004 Office Action.

(i) Real Party in Interest

The real party in interest in this appeal is Kemira Chemicals Oy, the assignee of the inventors.

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Related Appeals and Interferences

None.

(iii) Status of Claims

Claims 1, 2, 4-7 and 9-19 are pending in this application and have been twice rejected as obvious over various combinations of prior art. Claim 8 has been previously canceled. In a previously filed Amendment, to reduce the number of issues on appeal, appellants have cancelled Claims 1, 2, 4-7, 10-17 and have rewritten dependent Claim 9 in independent form. Appellants herein appeal the rejection of Claims 9 and 18-19. An appendix including the text of the appealed claims is attached.

(iv) Status of Amendments

The Office Action dated September 11, 2002 made final the rejection of Claims 1, 2, 4-7 and 9-18. Claims 1, 2, 4-7 and 9-16 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent 3,867,246 to Hebbel et al. in view of WO 97/45586 with or without U.S. Patent No. 4,222,819 to Fossum et al. Claim 14 was rejected under 35 U.S.C. §103(a) as being unpatentable over Hebbel et al. in view of WO 97/45586 as applied to Claim 1, and further in view of Fossum et al. Claim 17 was rejected under 35 U.S.C. §103(a) as being unpatentable over Hebbel et al. in view of WO 97/45586 as applied to Claim 1, and further in view of U.S. Patent No. 5,656,130 to Ali. Claim 18 was rejected under 35 U.S.C. §103(a) as being unpatentable over Hebbel in view of WO 97/45586 and Ali as applied to Claim 17, and further in view of Fossum et al.

In response, Appellants filed on December 11, 2002 an Amendment After Final Rejection, *inter alia*, amending Claim 18. An Advisory Action dated December 18, 2002, refused to enter the Amendment After Final Rejection on the grounds that it raised new issues

that would require further consideration, that it raised the issue of new matter and that it did not place the application in better form.

On February 6, 2003, Appellants filed an RCE with a Preliminary Amendment that added new independent Claim 19. A March 19, 2003 non-final Office Action was issued that entered the Preliminary Amendment and rejected Claims 1, 2, 4-7 and 9-19 under 35 U.S.C. 112, second paragraph, as being indefinite. Claims 1, 2, 4-7 and 9-19 also were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 3,865,685 or U.S. Patent No. 3,867,246 to Hebbel et al. ("Hebbel '685 or '246") in view of WO 97/45586 or WO 94/20674 with or without Fossum et al. Claim 14 was rejected under 35 U.S.C. 103(a) as being unpatentable over Hebbel '685 or Hebbel '246 in view of WO 97/45586 as applied to Claim 1, and further in view of Fossum et al as applied to Claim 1.

In response, on November 21, 2003, Appellants filed an Amendment traversing the rejections. The Office Action dated September 17, 2004 again rejected Claims 1, 2, 4-7 and 9-19 but no longer relied on any of the prior rejections of record and instead applied new rejections of the claims over a combination of prior art references. In response, Appellants filed a Notice of Appeal on January 15, 2005 along with the fee for a one month extension of time. Appellants filed on March 11, 2005 an Amendment canceling all pending claims except Claims 9, 18 and 19, in order to reduce the number of issues on appeal. Also, in the Amendment, Claim 9 was rewritten in independent form incorporating all the limitations of Claim 1 upon which it depended. This Amendment was filed to better focus and simplify the issues on appeal.

(v)**Summary of Claimed Subject Matter**

In one aspect (Claim 9), Appellants' invention as claimed is directed to an improvement in a method for the bleaching of chemical pulp, wherein the pulp is treated in a plurality of different steps and wherein at least in one step a bleaching solution which contains a peracid is used (p. 1, lines 5-8). The improvement claimed in the method is using the peracid in a post-bleaching carried out after the bleach plant steps in a pulp flow pipe, a storage tower and/or the paper machine (p. 7, lines 3-10), the post-bleaching taking place in the presence of one or several earth-alkali metal compounds (p. 3, lines 12-16), the pH of the post-bleaching solution is in the range of 3-8 (p. 4, lines 33-36), and the kappa number of the pulp before the post-bleaching with a peracid is at maximum 4 (p. 4, lines 13-17).

In another aspect (Claim 18), Appellants' invention as claimed is directed to a method for the bleaching of chemical pulp (p. 1, lines 5-6). The method comprises treating the pulp in a sequence of different steps at a bleaching plant (p. 7, lines 4-5), and finally in a post-bleaching step in a pulp flow pipe during transfer of the pulp, in a storage tower or at a paper mill outside the bleach plant (p. 6, line 36, p. 7, lines 1-10). The post-bleaching is applied to a pulp having a kappa number at maximum 4 (p. 4, lines 13-17) and comprises use of a bleaching solution containing peracid (p. 1, lines 8-10) and having a pH within the range of 3-8 (p. 4, lines 33-36), in the presence of one or several earth-alkali metal compounds (p. 3, lines 12-16). The peracid turns colorless chromophoric groups in the pulp (p. 4, lines 17-19).

In another aspect (Claim 19), Appellants' invention as claimed is directed to a method for the bleaching of chemical pulp (p. 1, lines 5-6). The method comprises treating the

pulp in a sequence of different steps at a bleach plant (p. 7, lines 4-5), transferring the treated pulp outside the bleaching plant (p. 3, lines 16-18) and subjecting said treated pulp to a post-bleaching step outside the bleach plant in a pulp flow pipe during transfer of the pulp, in a storage tower or at a paper mill (p. 6, line 36, p. 7, lines 1-10). The post-bleaching is applied to a pulp having a kappa number at maximum 4 (p. 4, lines 13-17) and comprises use of a bleaching solution containing peracid (p. 1, lines 8-10) and having a pH within the range of 3-8 (p. 4, lines 33-36), in the presence of one or several earth-alkali metal compounds (p. 3, lines 12-16). The peracid turns colorless chromophoric groups in the pulp (p. 4, lines 17-19).

(vi) Grounds of Rejection to Be Reviewed On Appeal

Whether Claims 9, 18 and 19 are unpatentable under 35 U.S.C. §103(a) over EP 0489 469 (EP '469) with or without U.S. Patent No. 6,007,678 to Linsten et al. (Linsten et al.) with or without U.S. Patent No. 5,129,987 to Joachimides et al. (Joachimides et al.), with or without U.S. Patent No. 5,656,130 to Ali (Ali), and further in view of U.S. Patent No. 2,822,236 to Sheldon (Sheldon).

(vii) Argument

(a) Appellants' Claimed Invention

1. The Problem Addressed by Appellants' Invention

In ordinary bleaching of chemical pulp through a sequence of treatment steps at a bleaching plant, the goal is to achieve a high brightness by removal of lignin, a high degree of delignification being implied by a low kappa number. A drawback in such a process is that the brightness of the delignified pulp obtained is not stable, but tends to decrease after the pulp has

left the bleaching plant, resulting in decreased brightness of the final product made from the pulp, usually paper. The problem thus is how to compensate for such decreasing brightness economically and without compromising the quality of the final product, that is with as little loss in viscosity of the pulp and thereby in the strength of the final product as possible.

It is important to note that in the post-bleaching according to Appellants' invention, the pulp already is highly delignified as indicated by the low kappa number of 4 or less. The prior art bleaching processes of chemical pulp are essentially described as being based on delignification. However, there is little room for further delignification of a highly delignified pulp, and seeking an improved brightness through that route would require large amounts of bleaching chemicals, making the process ineffective and expensive. This is discussed on page 2, lines 16-18 of Appellants' specification, and the same is demonstrated by Fig. 1 on page 12 of the article by Dence et al., recently cited in the corresponding EP application and cited in an Information Disclosure Statement filed November 4, 2004.

**2. Appellants' Solution: Post Bleaching Outside the Bleaching Plant
 Peracid In The Presence of an Earth Alkali Metal**

The solution provided by Appellants' invention is post-bleaching carried out in a pulp flow pipe, a storage tower and/or a paper machine, i.e., at locations outside a standard bleaching plant, by use of peracid in the presence of an earth-alkali metal compound producing the effects sought by Appellants' invention by turning colorless chromophoric groups present in the pulp. The latter, which is essentially distinct from bleaching through delignification, is specifically required by the wording of Claim 19. Even if there may be some further delignification during post-bleaching, the working examples in Appellants' application show that

the improved brightness achieved essentially results from removal of chromophoric groups and not from marked further delignification.

More specifically, this is shown clearly by examining the results shown in the table on page 10 of Appellants' specification, belonging to Example 3. In the comparative experiments 3 and 4, only peracid (PAA) was used for post-bleaching without an added earth-alkali metal compound, namely magnesium sulfate. In the otherwise similar experiments 1 and 2 carried out according to Appellants' invention, an amount of magnesium sulfate was also used. In comparative experiments 3 and 4, the brightness was increased from 86.8 ISO to 88.4 or 88.6 ISO, while the kappa number was lowered from 1.7 to 1.4 or 1.3, indicating some delignification of the pulp. At the same time the viscosity dropped from 642 dm³/kg to 572 or 564 dm³/kg, revealing a marked reduction of the strength. In sharp contrast, in experiments 1 and 2 carried out according to Appellants' invention, the improvement in brightness was greater, to 88.9 or 89.1 ISO, and the viscosity drop was much smaller, to 625 or 633 dm³/kg, an almost negligible drop from the initial 642 dm³/kg. And most significantly, the kappa number was only lowered to 1.6. In other words, there was much less delignification than in comparative Examples 3 and 4, and the brightness achieved was higher. This is clear proof that by use of the earth-alkali metal compound in combination with a peracid during a post bleaching outside the bleach plant, the invention provides significantly improved results that are produced through removal of chromophoric groups from the pulp rather than any major delignification.

3. Post Bleaching Outside a Bleach Plant Is Not Standard Bleaching

Appellants' invention as claimed is directed to a method for the bleaching of chemical pulp. An understanding of Appellants' invention requires an understanding of the operation of a bleach plant which is well known to a person skilled in the art. For example, U.S. Patent No. 5,632,859 to Heitto et al., (of record here) describes various production sections located in separate buildings and connected with transfer pipings as the conventional arrangement of pulp mills (*see* column 7, line 23) or a bleaching plant (*see* column 8, line 49) among such production units or sections. Furthermore, Appellants' Claims 9, 18 and 19 define a pulp flow or transfer pipe, a storage tower or a paper mill as locations for the post bleaching, providing further clarification of the term "outside the bleach plant." Heitto et al. describe transfer pipings (col. 1, lines 36-37) and a storage section (col. 7, line 23) as parts of a pulp mill that are separate from the bleaching plant. A paper mill, not mentioned by Heitto et al., is even more distinct from a bleaching plant, an entity separate from the entire pulp mill.

Post-bleaching is applied to pulp for which the delignification process proper in a bleach-plant is already finished. A high degree of delignification, a high brightness, and a low kappa number are attained by Appellants' claimed method. The purpose of post-bleaching is to compensate for the decrease of brightness and thereby avoid the need of overbleaching in the delignification process. Overbleaching is disadvantageous because it results in a high consumption of chemicals. Post-bleaching is carried out outside the bleach plant in a pulp flow pipe or a storage tower or at a paper machine.

In Appellants' claimed method for the bleaching of chemical pulp, peracid is used in combination with at least one earth-alkali metal compound in the post-bleaching step that takes place outside of the bleach plant. The claimed method brings about an increase of brightness while the use of the earth-alkali metal compound effectively counteracts the adverse effect peracid alone would have on the viscosity and strength of the pulp. This has been shown in the working examples.

Post-bleaching outside a bleach plant cannot be equated with standard bleaching. A skilled person knows that bleaching consisting of a sequence of treatment steps with different chemicals is an integral process yielding a finished product, a highly delignified pulp with a high brightness. As mentioned, the problem is that the delignified pulp tends to lose some brightness during prolonged storage before being used for papermaking. A method to compensate for such a loss would be to bleach the pulp above the required brightness already at the bleach plant. Referring to Fig. 1 on page 12 of Dence et al., the curves clearly show how the effect of added chemicals decreases with increasing brightness, i.e., the higher the final brightness the less economical the process grows in terms of chemicals consumed. A loss of brightness is most noticeable at the uppermost end of the brightness range.

To achieve a better economy the present invention applies post-bleaching to give a final lift to the brightness of the pulp after the bleaching sequence proper. The reactions produced by the combination of peracid and an earth-alkali metal compound attack the chromophoric groups present in the pulp rather than, or in preference of, the residual lignin therein. A high level of final brightness is thereby achieved with reduced chemical

consumption. The beneficial effect of the combination of a peracid and an earth-alkali metal compound in removal of chromophoric groups from a highly delignified pulp is not taught or suggested by any of the references cited by the Examiner.

(b) Claims 9, 18 and 19 Are Patentable Over EP '469 With or Without Linsten et al., With or Without Joachimides et al., With or Without Ali, and Further In View of Sheldon

The rejection of Claims 9, 18 and 19 under 35 U.S.C. § 103(a) as being unpatentable over EP '469 with or without Linsten et al. with or without Joachimides et al., with or without Ali, and further in view of Sheldon (Office Action dated September 17, 2004, p. 4) should be reversed.

1. The Primary Reference, EP '469, Is Clearly Deficient

The Examiner argues that "EP 0 480 469 teaches a method of bleaching a chemical pulp (organosolv and kraft, see page 5) in a plurality of different steps wherein at least one bleach solution contains a peracid e.g. peracetic acid (page 5, lines 20-25) where the peracid stage is the last step (page 5, lines 48-50) to obtain a pulp brightness of 88% ISO in the bleaching sequence (O-Z-P_A). See EP 0 480 469, page 6, lines 9-11 for a peracid pH of 2 to about 6. Obviously in the O-Z- P_A sequence the kappa number would be 2.0 after the O-Z stages and prior to the P_A stage as such is taught by EP 0 480 469 in Example 22, see Table." Office Action dated September 17, 2004, p. 2. The Examiner further cites page 7, lines 29-30 of EP '469 as describing the use of magnesium sulfate in the peracid bleaching stage. Office Action dated September 17, 2004, pp. 2-3.

However, the primary reference, EP '469, is clearly deficient. EP '469 does not describe post-bleaching at locations outside a bleach plant. Bleaching is only carried out as sequences of consecutive steps that a skilled person would carry out successively at a bleach plant. The working examples of EP '469 consistently strive for delignification as stated in the tables and also confirmed by the decreased kappa numbers. The kappa numbers below 4 are all final results achieved by the various treatments. In sharp contrast to Appellants' claimed method, there is no teaching or suggestion in the specification or examples of a post-bleaching treatment applied to a pulp having an initial kappa number of 4 or less. Moreover, the teaching of "complete" bleaching by EP '469, if anything, teaches a skilled person away from post-bleaching according to the present invention.

As the Examiner correctly states in his argument, EP '469 does describe the use of peracid together with magnesium sulfate, but for a completely different purpose, namely, delignification of pulps with higher kappa numbers. There is no description or suggestion of using peracid with earth-alkali metal compounds for removing chromophoric groups in a post-bleaching step, as claimed in appellant's method (Claims 9, 18 and 19).

The Examiner further argues that Appellants' claimed post-bleaching "does not define over the final per compound bleaching stage of EP 0 480 469. See EP 0 480 469, page 6, lines 32-36, for using 0.5% to about 4% (w/w) peroxy compound on oven dry pulp which reads on the 0.1 to 7 kg/tp of claim 4." Office Action dated September 17, 2004, p. 2. However, post-bleaching in a flow pipe or storage tower, or on the paper machine are the subject matter of Claims 9, 18, and 19. These are the specific locations for the post-bleaching according to

Appellants' invention. EP '469 does not refer to such separately performed final bleaching in any manner whatsoever. Rather, EP '469 describes only bleaching that is performed in an ordinary bleach plant. Claims 9, 18, and 19 are remote from EP '469, as well as the other references relied on in the Office Action. The method claimed by Appellants' in Claims 9, 18 and 19 improves post-bleaching which is performed separately outside the sequential bleaching that is performed in an ordinary bleaching plant. Thus, it would not be obvious to modify the teachings of EP '469 to bleach the pulp in a flow pipe, storage tower or on a paper machine without applying hindsight gleaned from Appellants' disclosure which is clearly improper.

The Examiner also argues that the use of a peracid by EP '469 not only reduces the lignin from the pulp but also turns colorless the chromophoric groups in the pulp: "The purpose of bleaching is to turn colorless the chromophoric groups in the pulp, besides the peracid of EP 0 480 469 would act on the pulp in the same manner as the claimed peracid as it is the same chemical reacting with the same starting material, e.g., chemical pulp." Office Action dated September 17, 2004, p. 3. This argument is beside the point. While the use of peracid not only reduces lignin from the pulp but also turns colorless chromophoric groups in the pulp, this occurs in the bleaching step(s) during the bleaching process in a bleach plant. What Appellants' method concerns is the post-bleaching step outside the bleach plant where the use of peracid alone would be uneconomical. As pointed out above and shown in comparative examples 1 and 2 in Appellants' specification, even if one used peracid alone in the post-bleaching step, the resulting treatment would reduce lignin content of the pulp, increase brightness somewhat, but at the cost of reduced strength of the pulp. This process would be uneconomical and would not teach or suggest Appellants' claimed method in which a post-bleaching step the combination of a

peracid with an alkali metal salt is used to increase brightness while not substantially reducing the strength of the pulp.

EP '469 describes bleaching in a close sequence of subsequent steps typically performed at a bleach plant. Such a sequence achieves a high degree of delignification that is a low kappa number, as well as a high brightness. EP '469 teaches that nothing more needs to be done for the pulp. However, after such "complete" bleach, the brightness of the pulp may lower during storage, and post-bleaching is a measure taken to remedy this. Post-bleaching is typically carried out separately after the pulp has left the bleaching plant, and works by turning the pulp's chromophoric groups colorless rather than reducing the already very low residual lignin in the pulp. This is a clear difference from the cited references, which teach use of peracid compounds specifically for removing lignin from the pulp. See Appellants' specification at page 4, lines 13-21. Moreover, Claim 18 specifically recites that the peracid is used to turn colorless chromophoric groups in the pulp in the post-bleaching step, and Claims 18 and 19 clearly recite that the post-bleaching step takes place outside of the bleach plant.

2. The Secondary References Do Not Cure the Deficiencies of EP '469

a. Linsten et al.

The teaching of the secondary references does not cure the above stated deficiencies of EP '469. Acknowledging implicitly the deficiency of EP '469, the Examiner argues that "Linsten et al. teaches peracid bleaching of chemical pulps having a kappa number as low as 2.0 (column 5, lines 24-30)" and that "[i]t would have been obviously [sic] that the post-bleaching stage of EP 0 480 469 could use a chemical pulp having a kappa number as low as 2.0

as taught by Linsten et al.” Office Action dated September 17, 2004, p. 2. However, Linsten et al. does not describe or suggest post-bleaching at locations outside a bleach plant. There is an overall mention of an initial kappa number ranging from 2 to 100, but the process is specifically described as one for delignification, not for turning colorless chromophoric groups without corresponding removal of lignin carrying these groups as demonstrated by Example 3 of the present application. Peracids are mentioned as delignifying chemicals, but Linsten et al. does not teach or suggest the use of any earth-alkali metal compounds therewith. Indeed, Linsten et al. only make a passing mention of earth alkali metals for pretreatment of pulp directly after digestion in the description of the background art at column 1, lines 22-32 of Linsten et al. Moreover, the peracid delignification is not the final stage, but is followed by treatment with a complexing agent and a subsequent chlorine-free peroxide bleaching. See column 6, lines 31-32, as well as Claim 1 of Linsten et al. Peracid treatment with or without earth alkali metal compounds is nowhere disclosed as a final post-bleaching as in Appellants’ invention as claimed in Claims 9, 18 and 19. Thus, Linsten et al. do not cure the deficiencies of EP ‘469 and the combination of EP ‘469 with Linsten et al. does not teach or suggest Appellants’ claimed method.

b. Joachimides et al

Joachimides et al. do not cure the above stated deficiencies of EP ‘469 and Linsten et al. The Examiner relies on Joachimides et al. as teaching (column 3, lines 18-21) that the last bleach stage is performed in a post-bleaching tower, arguing that it “would have been obvious to perform the last bleach stage of [EP ‘469] in a post bleaching tower as taught by Joachimides et al.” Office Action dated September 17, 2004, p. 3. However, Joachimides et al.

describes bleaching of mechanical wood pulp, not chemical pulp, and is therefore, wholly irrelevant to, and does not teach or suggest Appellants' method as claimed in Claims 9, 18 and 19. In mechanical wood pulps, delignification is deliberately avoided. All bleaching is based on removal of chromophores. In other words, mechanical wood pulps do not have low kappa numbers, and kappa numbers in general are not a relevant characteristic to describe mechanical wood pulp. Due to these differences, a person skilled in the art would not combine the teachings of Joachimides et al. with that of EP '469. Joachimides et al. uses the term "post-bleaching." This is an essential part of the bleaching process carried out in a specific bleach tower, yielding bleached mechanical wood pulp. This is in no way compares to, teaches, or suggests the post-bleaching according to Appellants' method as claimed in Claims 9, 18 and 19, which call for treatment of a highly delignified pulp outside the actual bleach plant.

Moreover, Jochimides et al. is deficient in not teaching or suggesting use of peracid or earth-alkali metal compounds in combination with the peracid in the post bleaching, as claimed by appellants herein. The chemicals described by Joachimides et al. are an alkali hydrosulfide and chelating agents such as EDTA or DTPA (See Claims 1, 7 and 8 of Joachimides et al.), which do not teach or suggest the use of earth alkali metal salts, as claimed by appellants in Claims 9, 18 and 19 herein. Thus, the combination of Joachimides et al. with EP '469 and Linsten et al. is improper and even if combined, the combination of EP '469, Linsten et al., and Joachimides et al. does not teach or suggest Appellants' claimed method.

c. Ali

Ali does not cure the above stated deficiencies of EP '469, Linsten et al., and Joachimides et al. Ali is cited as teaching "that in multi-stage bleach sequences inorganic peroxy acid salts could further brighten (GEB values 85 to 93) the bleached pulp (column 12, lines 36-41 and column 13, lines 28-31) by converting any of the remaining chromophoric groups to colorless derivatives." Office Action dated September 17, 2004, p. 3-4. According to the Examiner, "It would have been obvious to one of ordinary skill in the art that the final per compound bleaching stage of EP '469, which bleaches to a brightness of over 85%, would be turning chromophoric groups in the pulp to colorless derivatives as such is taught by Ali." *Id.* at 4. However, Ali does not teach or suggest a final bleaching step applied to chemical pulp having a kappa number 4 or less before the final bleaching step. Ali describes a final bleaching process step which converts remaining chromophoric groups in lignin into colorless derivatives. At the same time, this step is still described primarily as a lignin removal step. Reduced delignification to save the viscosity of the pulp is not described or hinted at by Ali. Significantly, the pulp is not taught to be transferred to another location outside the bleach plant before the final step. Instead, a bleach plant is specifically mentioned as the location for the invention, i.e., the entire bleaching process, see column 5, line 48 of Ali. If anything, this teaches away from Appellants' claimed method. Thus, Ali does not cure the deficiencies of EP '469, Linsten et al. and Joachimides et al., and its combination therewith does not teach or suggest Appellants' Claims 9, 18 and 19.

d. Sheldon

Sheldon does not cure the above stated deficiencies of EP '469, Linsten et al., Joachimides et al., and Ali. If anything, Sheldon teaches away from the Appellants' invention. The Examiner cites Sheldon as teaching "that peroxide, one of the disclosed alternative per compound bleaching agents of EP 0 480 469, could be used to bleach bleached chemical pulp, before during or after the drying the pulp just prior to storage or shipment." Office Action dated September 17, 2004, p. 4. The Examiner argues that it would have been obvious to have the final post bleaching stage of EP 0 480 469 outside the bleach plant, e.g., during or after drying or just prior to storage or shipping, in the manner taught by Sheldon." *Id* However, Sheldon et al. describes the making of a brightness-stable pulp to avoid brightness loss during storage or shipping. Sheldon recognizes the problem of loss of brightness after standard bleaching, and even discourages overbleaching as a solution, but then seeks to solve the problem with hydrogen peroxide treatment at the plant. The final bleaching stage is an integrated part of the bleaching proper, not a post-bleaching after the highly delignified pulp has been removed from the bleach plant, that is, during transfer or in a separate storing tower for instance. Use of a earth-alkali metal compound in a post-bleaching treatment with a peracid, which has been demonstrated as essential for preserving the viscosity and strength of the pulp in Example 3 of Appellants' specification, is not taught or suggested by Sheldon. Thus, the approach by Sheldon is opposite to and does not teach or suggest, alone or in combination with EP '469, Linsten et al., Joachimides et al. and Ali, the method claimed by Appellants in Claims 9, 18 and 19.

For these reasons, Appellants respectfully submit that Claims 9, 18 and 19 define patentable subject matter over the combined teachings of EP '469, Linsten et al., Joachimides et

al., Ali and Sheldon. The rejection of such claims under 35 U.S.C. §103(a) as obvious over this combination of references does not set forth a *prima facie* case of obviousness and should be reversed.

Summary

The combination of the five references is improper because it relies on improper hindsight in picking and choosing isolated teachings from each of the references to “arrive at” the Appellants’ claimed method. However, looking at the references objectively, they do not prospectively, alone or in combination, teach or suggest Appellants’ claimed method.

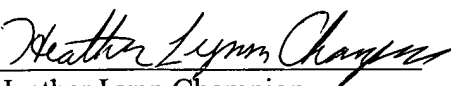
Firstly, the sheer number of references needed by the Examiner in an attempt to negate the invention highlights the weakness of the rejection. Secondly, and more importantly, none of the additional secondary references supply the deficiencies of the primary reference EP ’469. Linsten et al. and Ali do not teach post-bleaching at the specific locations outside the bleach plant. Joachimides et al. refers to post-bleaching, but does not deal with the problem of loss of brightness peculiar to delignified chemical pulp. Joachimides et al. only describes the treatment of mechanical pulps; their so-called post-bleaching merely being a standard bleaching step in a bleach tower to produce a finished product. And none of the five references teaches or suggests post-bleaching outside of the bleach plant with peracid and an earth alkali metal salt to increase brightness without decreasing strength of the pulp by removing chromophoric groups in the pulp without attacking the residual low amount of lignin remaining in the pulp after bleaching in the bleach plant.

Conclusion

For the reasons set forth herein, the rejections applied to Claims 9, 18 and 19 under 35 U.S.C. §103(a) should be reversed.

Respectfully submitted,

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APPENDIX

APPEALED CLAIMS

CLAIMS 1-8. (Canceled).

CLAIM 9. (Previously presented) In a method for the bleaching of chemical pulp, wherein the pulp is treated in a plurality of different steps and wherein at least in one step a bleaching solution which contains a peracid is used, the improvement in which the peracid is used in an post-bleaching which is the last step of the bleaching process, the post-bleaching taking place after the bleach plant steps in a pulp flow pipe, a storage tower and/or the paper machine in the presence of one or several earth-alkali metal compounds, wherein the pH of the post-bleaching solution is within the range of 3-8, and the kappa number of the pulp before the post-bleaching with a peracid is at maximum 4.

CLAIMS 10-17. (Canceled).

CLAIM 18. (Previously presented) A method for the bleaching of chemical pulp, comprising treating the pulp in a sequence of different steps at a bleaching plant, and finally in a post-bleaching step in a pulp flow pipe during transfer of the pulp, in a storage tower or at a paper mill outside the bleach plant, said post-bleaching being applied to a pulp having a kappa number at maximum 4 and comprising use of a bleaching solution containing peracid and having a pH within the range of 3-8, in the presence of one or several earth-alkali metal compounds, the peracid turning colorless chromophoric groups in the pulp.

CLAIM 19. (Previously presented) A method for the bleaching of chemical pulp, comprising treating the pulp in a sequence of different steps at a bleach plant, transferring

the treated pulp outside the bleaching plant and subjecting said treated pulp to a post-bleaching step outside the bleach plant in a pulp flow pipe during transfer of the pulp, in a storage tower or at a paper mill, said post-bleaching being applied to a pulp having a kappa number at maximum 4 and comprising use of a bleaching solution containing peracid and having a pH within the range of 3-8, in the presence of one or several earth-alkali metal compounds, the peracid turning colorless chromophoric groups in the pulp.